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An e-learning supported Train-the-Trainer program to implement a suicide practice guideline. Rationale, content and dissemination in Dutch mental health care☆

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ABSTRACT

An e-learning supported Train-the-Trainer program was developed to implement the Dutch suicide practice guideline in mental health care. Literature on implementation strategies has been restricted to the final reporting of studies with little opportunity to describe relevant contextual, developmental and supporting work that would allow for a better interpretation of results and enhance the likelihood of successful replication of interventions. Therefore, in this paper we describe the theoretical and empirical background, the material and practical starting points of the program. We monitored the number of professionals that were trained during and after a cluster randomized trial in which the effects of the program have been examined.

Each element of the intervention (Train-the-Trainer element, one day face-to-face training, e-learning) is described in detail. During the trial, 518 professionals were trained by 37 trainers. After the trial over 5000 professionals and 180 gatekeepers were trained. The e-learning module for trainees is currently being implemented among 30 mental health care institutions in The Netherlands.

These results suggest that an e-learning supported Train-the-Trainer program is an efficient way to uptake new interventions by professionals. The face-to-face training was easily replicable so it was easy to adhere to the training protocol. E-learning made the distribution of the training material more viable, although the distribution was limited by problems with ICT facilities. Overall, the intervention was well received by both trainers and trainees. By thoroughly describing the material and by offering all training materials online, we aim at further dissemination of the program.

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1. Introduction

A consistent finding in research of health services is the slow uptake of new evidence into clinical practice (Bodenheimer, 1999). To address this problem, clinical practice guidelines in which evidence is transformed into practical recommendations are developed. Despite, difficulties arise in altering daily practice by the provision of guidelines, since adherence to guidelines is not self-evident. The extent of guideline adherence depends on the effectiveness of dissemination and implementation strategies (Davis and Taylor-Vaisey, 1997; Grol and Grimshaw, 2003). Theory-based and tailored implementation approaches are

widely developed and studied (Hanbury et al., 2012) but no ‘magic bullet’ (Oxman and Flottorp, 2001) to improve health care has been found to date. Knowledge of effective implementation strategies is limited, whether from highly controlled studies with limited external validity, or from field studies with no significant effect or small effect sizes. Moreover, patient outcomes are rarely assessed in implementation studies.

In 2012, the Dutch multidisciplinary practice guideline on the assessment and treatment of suicidal behavior (PGSB) (Van Hemert et al., 2012) has been issued. It is assumed that adherence to this guideline by (mental) health care professionals may result in a reduction of fatal and non-fatal suicidal behavior (Bool et al., 2007). So, aiming at reducing the suicide rate in The Netherlands, Dutch (mental) health care institutions face the challenge of applying the guideline in daily practice. Regarding implementation in psychiatry, two systematic reviews (Girlanda et al., 2013; Weinmann et al., 2007) showed a modest effect of implementation of psychiatric guidelines on care and patient outcome, and concluded that there is a need for more studies on the effects of guideline implementation at both a patient and professional level.

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Consequently, we examined the effectiveness of an e-learning supported Train-the-Trainer program (TtT-e) aiming at PGSB-guideline adherence by mental health care professionals. This was studied in a cluster randomized trial (PITSTOP SUICIDE trial) including 45 departments from nine mental health care institutions (MHIs) throughout The Netherlands. The effects of TtT-e have been compared with traditional guideline dissemination (i.e. guideline access via books, internet, reviews in clinical journals and conferences). Outcomes were monitored at the level of mental health care professionals, patient level and institutional level, (De Beurs et al., 2013a, 2013b) and also the cost-effectiveness was evaluated (Dutch Trial Register 3092). As compared with usual implementation strategies, PGSB-dissemination via TtT-e more likely results in guideline adherence of mental health care nurses, and in improved self-perceived knowledge and confidence of professionals of all disciplines (De Beurs et al., 2015). In addition, suicidal patients diagnosed with depression and treated by TtT-e trained professionals more likely reported that suicidal thoughts were discussed with their therapist. As no difference in health care uptake between patients was found, we concluded that our intervention was not cost-effective (De Beurs, 2015). By users, the program is well received and considered suitable for ongoing PGSB-dissemination in mental health care. It turned out to be easily replicable by trained trainers and resulted in modifications of institutional policies toward care for suicidal patients De Groot et al. 2015.

Considering the promising effects of the TtT-e program, we assume that the program will be used in non-research contexts. This underlines the need to elaborate the contextual, developmental and supporting work that allow for a better interpretation of the study findings and may increase the likelihood of successful replication of the program's application in other contexts (Eccles and Mittman, 2006). In this paper we describe the empirical and theoretical resources of the PGSB, which the TtT-e program is based on. We also describe the steps of the TtT-e program's development, aims and competences, outline, practical starting points and the supporting training materials including the supporting e-learning modules. Monitoring of the implementation of new interventions to improve health is a relevant part of implementation processes (Campbell et al., 2000). Therefore, we also present outcomes of a quantitative study on the dissemination of the TtT-e program during and after the PITSTOP SUICIDE trial. We also present figures of how often the supporting e-learning modules were viewed inside the PITSTOP SUICIDE trial.

2. The empirical and theoretical framework of the TtT-e program

2.1. Development of the PGSB: empirical resources

The TtT-e program is designed on the base of the PGSB of which the development has been commissioned by the Dutch Ministry of Health, Welfare & Sports (VWS) in 2009. The development was carried out by representatives of the Netherlands Psychiatric Association (NVvP), the Dutch Association of Psychologists (NIP) and the Dutch Nurses' Association (V&VN). The process was funded by The Netherlands Organization for Health Research and Development (ZON-MW) and supported by the National Institute of Mental Health and Addiction in The Netherlands (Trimbos Institute). The EBRO (Evidence-based Richtlijn Ontwikkeling)-method (Van Everdingen et al., 2004), which is based on the AGREE-method (AGREE Collaboration, 2003) served as guidance during the writing process. The EBRO-method emphasizes the evidence-based character of guidelines by translating practice-based issues into concrete questions, for instance: How often should the suicidal condition be assessed? What should be recorded in a safety plan? Questions are countered by a summary of the available evidence.

International suicide guidelines such as the suicide guideline of the American Psychiatric Association (2003), the New Zealand Guideline Group (2003), the National Institute for Clinical Excellence (NICE) (2004), the Royal Australian and New Zealand College of Psychiatrists

(2004) and the Royal College of Psychiatrists (2004, 2010) in addition to extensive reviews of the Scottish Government Social Research Group (2008a, 2008b) served as starting points for literature searches. Conclusions were formulated in a four-fold classification of the level of evidence ranging from level 1 (strong evidence, highly recommended or dissuaded) to level 4 (reflecting experts opinions). If applicable, conclusions are followed by a paragraph with additional considerations that are relevant for the interpretation of the evidence. Finally, recommendations were worded in terms of (professional) behavior. Recommendation vary across a continuum. The strength of recommendations matches with the level of the evidence. To readers, the strength of the recommendation is recognized by standard wordings that are applied for the different levels of strength.

2.2. Theoretical and practical framework for the assessment of suicidal behavior

In the PGSB, an integrated model of stress–diathesis (Goldney, 2008) and entrapment (Williams et al., 2005) is used to explain the onset and maintenance of suicidal conditions. The integrated model depicts suicidal behavior as the outcome of a process influenced by the interaction of biological, psychological, environmental and situational factors (Wasserman et al., 2012); the interaction that may lead to the perception of being trapped (entrapment). Entrapment leads to feelings of hopelessness and is proposed to be the specific condition in which suicidal behavior arises. For systematic investigation of the suicidal condition, it is recommended to apply the Chronological Assessment of Suicidal Events (CASE)-interview (Shea, 1998). Subsequently, biological, psychological, environmental and situational are weighted to identify risk and protection factors for suicide of the patient. This results in a structure diagnosis of the suicidal behavior. Finally, treatment strategy is determined, including a safety plan and policy on continuity of care (Van Hemert et al., 2012).

3. Empirical considerations of an e-learning supported Train-the-Trainer approach to enhance PGSB adherence

3.1. Training of mental health care workers in suicide risk management

Likely effective interventions to reduce suicidal behaviors are mental health practitioner and gatekeeper education (Mann et al., 2005; While et al., 2012) aiming at early recognition and treatment of suicidal behavior and/or underlying psychiatric morbidity (Tompkins and Witt, 2009). Gatekeepers are professionals outside mental health care services who may get in touch with persons at risk for suicide and who can refer these persons to mental health care (such as general practitioners, teachers, clergies, social workers etc). This type of training has shown to improve knowledge, skills, and attitudes toward suicidal behavior (Isaac et al., 2009) of school staff (King and Smith, 2000), students (Stuart et al., 2003; Joffe, 2008), members of an Aboriginal community (Capp et al., 2001), youth workers (Chagnon et al., 2007), US Veterans Affairs workers (Matthieu et al., 2008), construction workers (Gullestrup et al., 2011) and mental health care workers (Appleby et al., 2000; Oordt et al., 2009). Professional and gatekeeper training in diagnosis and treatment of depressive disorders has been shown to result in a reduction of suicide rates when delivered to general practitioners (Rutz et al., 1992; Hegerl et al., 2010; Szanto et al., 2007; Wyman et al., 2008; Matthieu et al., 2008) and US Air Force personnel (Knox et al., 2003), and in a reduction of self-destructive acts in American Aboriginal adolescents (May et al., 2005).

3.2. Theoretical and empirical considerations of a Train-the-Trainer approach

A Train-the-Trainer model of small interactive educational training is based on Adult Learning Theory (Knowles, 1980), which states that

Table 1
Themes and topics of the e-learning supported Train-the-Trainer program.^a

Theme	Topics	Goals
1 Basic assumptions in dealing with suicidal behaviors	<ul style="list-style-type: none"> –fostering a therapeutic alliance with the suicidal patient, systematic assessment of suicidal behavior –participation of patient's VIPs in the assessment and treatment of the patient's suicidal behavior –taking care of safety –providing continuity of care 	
Practicing 1 Through role play	<ul style="list-style-type: none"> –fostering a working relationship with a suicidal patient and (if applicable) patients' VIPs –experiencing and exploring what it is to be a suicidal character –receiving feedback from a suicidal character on displayed professional behavior toward the suicidal character –the theoretical framework for suicidal behavior: the integrated model of stress diathesis (Goldney, 2008) and entrapment (Williams et al., 2005) 	Exploring and discussing the current suicidal condition (course, intensity and repetition of suicidal thoughts, intent, urgency, preparations, plans, acts, proposed consequences, extent of hopelessness)
2 Systematic assessment of suicidal behaviors	<ul style="list-style-type: none"> –CASE-interview (Shea, 1998) for systematic assessment of current and previous suicidal episode(s) 	
Practicing 2 through role play	<ul style="list-style-type: none"> –maintaining the working relationship with a suicidal patient and (if applicable) patients' VIPs –experiencing the exploration of suicidal thoughts as a suicidal character 	<ul style="list-style-type: none"> –exploring motives for the current episode (events, conditions, role of others, actions) –assessing previous suicidal episodes (course, intensity, intent, plans, preparations, consequences, urgency, extent of hopelessness, effective interventions, the role of VIPs) –exploring the patient's view toward the future
3 Diagnosis of the current suicidal condition	<ul style="list-style-type: none"> –the etiology and pathogenesis of the current suicidal condition –participation of patient's VIPs in the assessment of the patient's suicidal behavior 	
Practicing 3 through role play	<ul style="list-style-type: none"> –maintaining the working relationship with a suicidal patient and (if applicable) patients' VIPs –exercising on the application of the theoretical framework for suicidal behavior as a resource for the assessment of suicidal behavior –experiencing the discussion on hypotheses with the patient 	<ul style="list-style-type: none"> –assessment of (current and previous) suicidal behavior –weighting risk and protection factors discussing the hypotheses with the patient and (if applicable) with VIPs –formulating hypotheses on the etiology and pathogenesis of the current suicidal episode –using the therapeutic alliance with the patient to discuss hypotheses on the etiology and pathogenesis of the current suicidal condition
4 Safety and continuity of care	<ul style="list-style-type: none"> –setting safety priorities in suicidal crises –benefits and contents of a safety plan –possible roles and responsibilities of involved professionals and VIPs –benefits and means of providing continuity of care 	
5 Treatment of suicidal behavior	<ul style="list-style-type: none"> –possible interventions to enhance patient's safety –strategies of moderating the suicidal condition –strategies of moderating the impact of risk factors for suicidal behavior –strategies of strengthening protection factors for suicidal behavior –possible roles of VIPs and other professionals in reducing the short and long term suicide risk 	
Practicing 4 through role play	<ul style="list-style-type: none"> –using the therapeutic alliance with the patient to discuss treatment strategies –experiencing the discussion on treatment strategies as a suicidal patient 	<p>Practicing 4</p> <ul style="list-style-type: none"> –Establishing treatment strategies to moderate the current suicidal condition and/or the impact of risk factors and to strengthen protection factors –establishing roles and responsibilities of (if applicable) VIPs and professionals –adapting a safety plan –discussing treatment strategies with the suicidal patient and (if applicable) VIPs
6 Chronic suicidal conditions	<ul style="list-style-type: none"> –suicidal behavior in patients with borderline personality disorder (BPS) –pitfalls in the management of suicidal behavior in patients with BPS –dealing with suicidal behavior in patients with BPS –professional consultation, supervision 	

^a VIPs = relatives and/or friends of the suicidal patient; BPS = borderline personality disorder.

people who train others remember 90% of what they teach others, and on Diffusion of Innovation Theory (Rogers, 2003), stating that people adopt new information better through their trusted social networks. Training of mental health care professionals using a Train-the-Trainer model of small interactive training, limits the need to employ costly external expertise. Knowledge and skills are passed on and facilitated by peers instead of external experts. Its effectiveness is expected because benefits of training by peer-assisted learning in medical health education are comparable to those achieved by professional teachers (Topping, 1996; Fincher et al., 2000; Goodfellow and Schofield, 2001; Perkins et al., 2002; Field et al., 2007). In addition, peer-assisted learning has been shown to enable peer teachers to improve their theoretical knowledge along with their practice skills (Fincher et al., 2000).

Ongoing support and feedback when implementing psychiatric guidelines seems to be effective (Weinmann et al., 2007). Hence, trainers are supposed to continue their expert role in suicide prevention skills subsequent to the study period. It is assumed that this further strengthen their skills and/or may prevent that skills and expertise fade away after the trial is finished.

3.3. Empirical considerations of e-learning support

Advances in technology, the rise of costs in health care and the need for continuous education of (para)medical professionals have made e-learning a popular new educational method (Ruiz et al., 2006; Cook et al., 2008; Maloney et al., 2013). In a review of effective

implementation strategies, a combination of interactive postgraduate training including personalized feedback, and additional material such as a website was found to be more successful than a single-faceted approach (Gross et al., 2001; GroL and Grimshaw, 2003; Bloom, 2005). E-learning is expected to complement or replace face-to-face training in a medical setting (Maloney et al., 2013); it was found to help medical students become more actively involved in the study material and thereby help to internalize the material (Ruiz et al., 2006).

4. Development process and practical framework of the TtT-e program

4.1. Establishing the program's content

Guideline recommendations served as the starting point to set the competences in terms of professional behavior. The content was established according the following strategy. First, all guideline recommendations were listed. Second: via an inductive procedure, recommendations were clustered into six themes: 1) basic clinical skills when discussing suicidality; 2) systematic assessment of suicidal behavior; 3) diagnosis of the current suicidal condition; 4) safety and continuity of care, including participation of the patient's relatives; 5) treatment of suicidal behavior; and 6) chronic suicidal conditions (see Table 1). Themes were scheduled following the sequence of action in common clinical practice. For each module, aims were set. Four role playing exercises were designed in order to facilitate knowledge and skills practicing. Subsequently, in two separate meetings with two groups of experts on the topic (due to scientific achievements and/or clinical experience), the training was tried out. After that, the content and scheduling were discussed with experts. Based on their feedback, adjustments were made. For example, the sequence of the program schedule has been changed and the emphasis on the integrated model of stress-vulnerability and entrapment has been highlighted. Next, we described the competences to be achieved by the training (see Table 2). Finally, we designed a detailed schedule for a one-day training session. We estimated that a one-day duration was sufficient to achieve the competences and assumed that this was the maximum possible time for professionals to be absent from the workplace.

4.2. Practical starting points

In the application of the Train-the-Trainer model, there are three levels of acting: masters, trainers and trainees. Masters are experts in the field of suicide prevention due to scientific performance and/or clinical practice on the topic. Trainers are mental health care workers of various disciplines (psychiatrists, psychologists and registered mental health nurses), selected from the clinical staff of departments. To become a trainer, good training skill are desired and trainers have to be prepared to train their co-workers and are indicated to be competent to serve as a role model at institutional level and to provide future additional training. Trainees are members of multidisciplinary teams (e.g. psychiatrists, psychologists, nurses) engaged in the assessment, treatment and counseling of suicidal patients. Training is applied at two levels: first, trainers are trained by masters. Subsequently trainees are trained by trainers. The content of the training is similar at both levels. As mental health care is essentially multidisciplinary, training sessions are provided to multidisciplinary teams (GroL and Grimshaw, 2003) with a minimum of 12 and a maximum of 16 participants per (master) training session. It is estimated that this size is most suitable with respect to the possibility of discussing the content with the trainees, providing feedback on role playing and ensuring a safe learning environment.

Table 2

Competences to be achieved by the e-learning supported Train-the-Trainer model to improve adherence to the Dutch Multidisciplinary practice guideline on the assessment and treatment of suicidal behavior.

-
- I. The professional deals with suicidal behaviors of patients in the context of the guideline's basic assumptions, to achieve structured diagnosis of the suicidal behavior and to establish an appropriate treatment strategy. Basic assumptions are:
 - making contact with the suicidal thoughts of the patient is the bases of a therapeutic alliance with the suicidal patient and VIPs
 - suicidal behavior is a separate focus of diagnosis and treatment;
 - the patient's suicidal behavior is systematically assessed by using the integrated model of stress-vulnerability diathesis and entrapment to explain the onset of suicidal conditions and the CASE-interview for the assessment of suicidal conditions;
 - a focus on safety & continuity of care is a relevant part of the treatment strategy; and
 - the professional exerts on engagement of the patient's relatives in diagnosis and treatment.
 - II. The professional is able to foster a therapeutic alliance with a suicidal patient (and if applicable VIPs).

This goes to show that the professional:

 - discusses suicidal feelings, thoughts, plans and (former or planned) suicidal acts without any reluctance; and
 - shows interest and understanding to the patient (and if applicable VIPs).
 - III. The professional systematically explores risk and protection factors for suicide.

This goes to show that the professional:

 - executes the assessment by using the CASE-interview; and
 - focuses on stress and vulnerability factors that increases or decreases the suicide risk and explores to what extent the patient experiences his/her situation as being trapped.
 - IV. The professional uses knowledge of risk and protection factors to foster and maintain a working relationship with the patient (and if applicable VIPs).

This goes to show that the patient is (increasingly) prepared to share feelings, thoughts and relevant information with the professional.
 - V. The professional formulates hypotheses on the etiology and pathogenesis of the patient's suicidal behavior.

This goes to show that the professional:

 - discusses the hypotheses with the patient (and if applicable VIPs);
 - adjust hypotheses on the base of the patient's feedback (or feedback from his/her relatives); and
 - exerts on the patient's agreement (and if applicable on VIPs).
 - VI. The professional establishes short and long term strategies for the treatment of the suicidal behavior.

This goes to show that the professional's proposed strategies are focused on resources and factors protecting the patient from (attempted) suicide.
 - VII. The professional establishes safety and continuity of care for the suicidal patient, possibly and preferably in corporation with VIPs.

This goes to show that the professional:

 - makes a safety plan;
 - sets and executes follow-up assessments of the suicidal ideation to observe the course of the suicidal behavior;
 - adjusts treatment strategy if needed; and
 - exerts on the patient's agreement at all times (and if applicable on VIPs).
-

VIPs = relatives and/or the patient's significant others.

5. Training materials

5.1. PGSB summary, training manual and PowerPoint® presentation

A training manual and a PowerPoint presentation were designed by one of the researchers to help trainers organize the training. The manual provides a detailed description of competences (see Table 2) and aims per theme, a detailed minute-to-minute training time schedule, and appendices (i.e. the CASE-approach, a figure of the integrated stress-diathesis and entrapment model, practicing resources and forms to evaluate role playing sessions). The additional PowerPoint® Presentation guides trainers and trainees throughout the training sessions. Before each training, trainees were enhanced to download the PGSB summary from the internet and were asked to read it carefully. The summary includes a brief description of the theoretical and practical starting points of suicidal behavior management, schemes summarizing

recommendations on diagnosis and treatment of suicidal behavior, treatment setting, professional acting following completed suicide and recommendations on legal and privacy matters. It also includes specific recommendations for distinguished patient groups (elderly, children and adolescents) and professionals such as general practitioners and aid and emergency departments' staff (Van Hemert et al., 2012). During the trial period, digital versions of all training materials had been available by downloads from the research website. After the trial course, the materials were translated in English and are currently available from www.pitstopsuicide.nl.

5.2. Supporting e-learning modules

The TtT-e program is supported by two e-learning modules. The first module is developed for trainees and based on the five main recommendations of the guideline (fostering a working relationship with the suicidal patient by making contact, safety of patients, involving significant others, continuity of care, systematic assessment and treatment of suicidal behavior). To cover the content of the guideline, scenarios for six videos were developed by the research team. Interactions between mental health care professionals and suicidal characters (played by actors) are displayed. These are a chronically depressed older man, a young woman with borderline personality disorder, a psychotic homeless man, an old age narcissistic widower with a wish to die, a young man with latent suicide ideation and a chronically suicidal woman in a hospital after being treated at the emergency department for a suicide attempt). These characters were found to represent the variety of suicidal patients in mental health care (Huisman et al., 2011). By choosing a wide range of patient characters, it was aimed to make the module feasible for professionals from different types of treatment settings. We deliberately did not script the dialogues as we wanted to have as much a realistic scene as possible, and did not want the professionals to be acting. From the suicide expert network that was involved in the development of the guideline, two experienced nurses and two experienced psychiatrists were selected to play a role model in the module. Five actors played the five different patients and displayed prototypical suicidal symptoms, cognitions and interaction problems. In between vignettes, guideline topics and recommendations are explained by masters (that is, experts on the topic). The total running time of the module is 60 min.

A second e-learning module was developed for trainers. It shows a video tape of the first master training session. The 30-minute tape was processed into an e-learning format allowing trainers to review the exercises. Both modules are seven days a week online. All trainers were instructed to follow the training protocol manual when training trainees (De Beurs, 2015).

6. Dissemination of the TtT-e program

6.1. Study method

Dissemination of the training program was monitored within and outside the PITSTOP SUICIDE trial. The assessment of the program's further dissemination after the trial was a purpose of the study; outcomes are presented as the number of newly trained trainers and the number of professionals that were subsequently trained (see Fig. 1). This was assessed by contacting educational departments and/or key persons of MHI who tracked the rate of trained trainers and trainees within their MHI. We also monitored how many times training was provided by experts outside the trial context, and tracked how many professionals were subsequently trained by new trainers.

The use and users' opinion of the e-learning support material during the study was assessed via the online questionnaire package (De Beurs et al., 2013a). Participants were asked whether they had viewed the modules (yes/no) and for how many minutes. Information on dissemination of the e-learning module after the trial period was not available. Therefore, we present figures on the number of professionals that have access to the e-learning module after the trial period.

6.2. Dissemination of the program inside the PITSTOP SUICIDE trial

In October 2011 and January 2012, four masters trained an overall number of 37 trainers in two single sessions. Trainers were mental health care nurses ($n = 16$), one master of advanced nursing practice, psychologists ($n = 11$) and psychiatrists ($n = 9$). These trainers subsequently trained teams of co-workers in 37 training sessions. A total of 518 professionals were trained. The e-learning module for trainees was used by 122/518 professionals (23%) for an average of 40 min (SD 16).

6.3. Dissemination of the program outside the PITSTOP SUICIDE trial

Even before any result on the effectiveness of TtT-e was communicated, the program was disseminated widely as soon as the trial course was finished (October 2014). Trained trainers and experts went through with training colleagues, and also trained peers to become a trainer. Apparently the training material was user-friendly and enabled new trainers to subsequently train others as trainer. As far as we can ascertain, from October 2011 until December 2014 a total number of 151 new trainers were trained who trained approximately 5000 professionals in guideline application. In addition, approximately 180 gatekeepers (police officers, public mental health care, general practitioners) and other health care personnel (nurses from the aid and Emergency department and the intensive care unit of a general hospital) were trained (see Fig. 1). The e-learning module for trainers has been

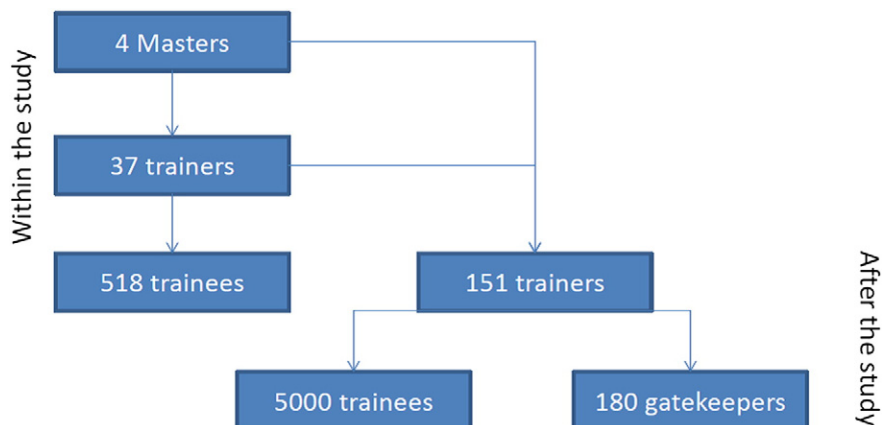


Fig. 1. Flow of dissemination of the TtT-e intervention within and after the study.

viewed 279 times from the start of the study up until October 2013 and turned out to be well received.

Dissemination of the e-learning module outside the study context after the trial termination was one of the purposes of the PITSTOP SUICIDE trial. E-learning module 1 (for trainees, see Table 1) is currently being implemented in 30 MHIs throughout The Netherlands via the GGZ-Ecademy, a collaboration of Dutch MHIs on the field of e-learning. The GGZ-Ecademy incorporated the content and structure of the e-learning module for trainees and applied their format and educational experience to improve the module, and made it more interactive. The adapted version is currently available to over 30,000 mental health professionals throughout The Netherlands.

7. Discussion

This paper provides the rationale and outline of an e-learning supported Train-the-Trainer intervention to implement a suicide practice guideline. Results show that after a one-day training by masters, trainers are ready to train their colleagues and even to train other trainers. This suggests that the face-to-face training was easily transmissible to new trainers. The e-learning modules for both the trainers and the trainees were well received, but there were problems with ICT-facilities that possibly may have limited the access and distribution of the modules. Even before the trial ended, the training program was distributed over 5000 professionals and the e-learning modules are currently available to 30,000 professionals. Likely, the program addresses the need of mental health care professionals to be trained in suicide prevention skills.

A strength of the study is its large scale, emphasizing the external validity of the findings. A limitation of the study is that presented figures, on the one hand, are based on quantitative assessment, and, on the other hand, on estimated figures and the number of professionals who have access to the e-learning module. We cannot rule out that figures are under or overestimated. Findings should therefore be interpreted with caution.

In the PITSTOP suicide trial, we did not examine the relative effectiveness of the different elements of TtT-e (the Train-the-Trainer element, the face-to-face training, the e-learning module, the multidisciplinary training). Still, although we have no direct evidence for the effectiveness of the e-learning separate from the effect of the face-to-face training, the e-learning module is currently being implemented as a stand-alone intervention within the Dutch mental health care system. A common argument for the use of e-learning is its cost-effectiveness (Welsh et al., 2003; Ruiz et al., 2006). Medical education is expensive (Walsh et al., 2013); via e-learning, costs can be reduced (Welsh et al., 2003; Ruiz et al., 2006). As costs of (mental) health care keep on rising, and budgets keep on slinking, health managers and policy makers are keen to only offer e-learning. However, there is a lack of methodological sound studies examining the cost effectiveness of e-learning by (mental) health professionals (Cook et al., 2010; Gordon et al., 2013; Welsh et al., 2003). Therefore, in collaboration with the GGZ-Ecademy, we aim at examining the (cost) effectiveness of the e-learning module. Until that, we argue that e-learning can be best offered in addition to a face-to-face training rather than as a substitute for we found that trainees highly appreciate the small group face-to-face training. Future studies should investigate whether certain parts of the face-to-face training can be replaced by e-learning. This may allow to shorten the face-to-face training. By clearly describing the rationale and outline of the training and by offering the full training material online, we aim at facilitating the distribution of the TtT-e program, and at stimulating subsequent research on guideline implementation in mental health care.

Competing interests

All authors declare to have no competing interests.

Authors' contributions

AK, MdG, and JdK obtained funding for this study. MdG, JdK and AK designed the intervention. MdG and DdP drafted the manuscript. AK and JdK contributed to the execution of the study and approved the final manuscript.

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